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High sensitivity Rn emanation studies applying cryogenic detector

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A novel system for ultra-sensitive Radon emanation studies has been developed. It is based on a cryogenic Radon detector coupled to two large-volume chambers, able to accommodate samples up to 250 L in volume. Due to the unique properties of the detector it is possible, for the first time, to study simultaneously emanation of two Radon isotopes, namely ^{222}Rn and the short-lived ^{220}Rn . Special design of the system results in an extremely low internal background, making detection of even single atoms of Radon possible. The design and performance of the detector system will be discussed and results of ^{222}Rn and ^{220}Rn emanation for various samples will be presented.

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